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PROGRAM HANDBOOK

ACOUSTICAL TESTING SERVICES

NISTIR 4428

OCTOBER 1990



*U. S. Department of Commerce
National Institute of Standards and Technology
Gaithersburg, Maryland 20899*

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**NVLAP PROGRAM HANDBOOK
ACOUSTICAL TESTING SERVICES
REQUIREMENTS FOR ACCREDITATION**

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**National Voluntary Laboratory
Accreditation Program**

NISTIR 4428

OCTOBER 1990

**U.S. DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899**

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I. PROGRAM SUMMARY

This document presents the operational and technical requirements to be fulfilled in order to gain accreditation for Acoustical Testing Services under NVLAP. All of the steps leading to accreditation are discussed. The technical requirements and how they are applied as NVLAP criteria are explained.

Laboratory accreditation for acoustical testing services was established in 1982 in response to a request from a manufacturer of acoustical absorption materials. The purpose of accreditation is to give national recognition to those laboratories found competent to perform specified acoustical tests.

Test methods covered:	Tests relating to the acoustical properties or performance of products. (See appendix E)
Period of accreditation:	One year
On-site assessment frequency:	Prior to initial accreditation and every two years thereafter.
Proficiency testing:	Required periodically for specific test methods. Participants will be advised as required.
Fees:	Administrative fee, assessment fee, test method fee (based on the number of test methods selected), proficiency test fee when required.
Assessors:	Peers from the acoustical community.

II. INTRODUCTION

Background

The U.S. Department of Commerce, National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS), administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP's function is to accredit public and private testing laboratories based on evaluation of their technical qualifications and competence for conducting specific test methods in specified fields of testing. Accreditation is granted on the basis of conformance with criteria published in the Code of Federal Regulations as part of the NVLAP procedures (15 CFR Part 7) (see Appendix A).

This document is intended for information and use by staff of accredited laboratories, those seeking accreditation, other laboratory accreditation systems, and others needing information on the requirements for accreditation under this NVLAP program. This document is generally included in the NVLAP Application Package along with General Application Forms, Test Method Selection Lists, and other materials needed to apply for or renew accreditation. It presents the administrative and operational procedures and technical requirements of the accreditation program and should be retained and be readily accessible to laboratory personnel.

NVLAP Accreditation

NVLAP accreditation is available to commercial laboratories, manufacturers' in-house laboratories, university laboratories, Federal, State, and local government laboratories. Foreign-based laboratories may be accredited by NIST if they meet the same requirements as domestic laboratories and pay any additional fees required (see Appendix B).

NVLAP is self-supporting and operates on a cost reimbursable basis by charging fees to those who pursue accreditation. The program receives no appropriated public funds.

Accreditation is granted only after thorough evaluation of the applicant has demonstrated that all NVLAP criteria have been met. Laboratories which successfully demonstrate compliance with the criteria are issued two documents to attest to that compliance: (1) a Certificate of Accreditation, and (2) a Scope of Accreditation which states the specific test methods and services for which the laboratories have been accredited (see Appendix D).

Why NVLAP Accreditation?

A laboratory may wish to be accredited for many reasons such as; legal requirements, regulations or codes, contract specifications, or the desire to be recognized as demonstrably competent to meet the needs of its clients.

NVLAP provides formal recognition of the competence of accredited laboratories to the user community. Information about accredited laboratories, including the name and scope of accreditation, is disseminated in various media.

For accreditation to be meaningful, it must be granted by a clearly credible organization. NVLAP provides an unbiased third party evaluation and recognition of performance as well as expert technical assistance to upgrade laboratory performance.

Testing Laboratory Defined

NVLAP defines "testing laboratory" as an organization that provides services to measure, examine, test, calibrate, or otherwise determine the characteristics or performance of materials, products or systems.

Accreditation Defined

NVLAP accreditation signifies recognition of a testing laboratory's competence to perform specific test methods in specified fields of testing. It means that the laboratory's quality system, staff, facilities and equipment, calibration procedures (unless not applicable), test methods and procedures, records, and test reports have all been evaluated and found to meet NVLAP criteria. NVLAP accreditation does not mean a guarantee (certification) of laboratory performance or of product test data; it is a finding of laboratory competence.

NVLAP Programs

Laboratories may participate in as many NVLAP programs as they wish, provided that they meet all NVLAP criteria for each program. Programs currently available are:

- | | |
|--|--|
| Acoustical Testing Services | Computer Network Interface Protocols |
| Asbestos in Bulk Insulation and Air Carpet | Construction Testing Services |
| Commercial Products Testing; | Admixtures, Aggregate, Cement, Concrete, Geotextiles, Road and Paving Materials, Soil/Rock |
| Paints and Coatings | Electromagnetic Compatibility and Telecommunications |
| Paper and Related Products | FCC, MIL-STD |
| Plastics | Personnel Radiation Dosimetry |
| Seals and Sealants | Thermal Insulation Materials |
| | Solid Fuel Room Heaters |

For further information about NVLAP, or for assistance in understanding and meeting the NVLAP requirements and criteria, please write or call:

NVLAP
National Institute of Standards and Technology *
Bldg 411 Room A124
Gaithersburg, MD 20899
Phone: (301) 975-4016
FAX: (301) 975-3938

* formerly the National Bureau of Standards (NBS)

III. OPERATIONAL INFORMATION AND REQUIREMENTS

The information and requirements presented in this section are generally applicable to all NVLAP programs. The requirements specified in Sections 7.31 and 7.32 of the NVLAP Procedures (Appendix A) and those specified in this section must be met in order to gain accreditation.

Laboratory Code Number (LAB CODE)

Each participating laboratory is assigned a four-digit laboratory code number. The code number is used by the NVLAP staff for identification, filing, record keeping, and database management. Participants are requested to put their Lab Code number on all correspondence with NVLAP. The Lab Code number is cross-referenced with the laboratory name and location in the NVLAP Directory of Accredited Laboratories.

Accreditation Period

Accreditation is granted for a period specified in the Accreditation Application Package (usually one year). The accreditation period begins on one of four dates: January 1, April 1, July 1, or October 1. Once a laboratory has been assigned an accreditation date, it retains that date as long as it remains in the program. Accreditation both expires and is renewed on that date.

Authorized Representative

The laboratory must designate an Authorized Representative to sign the application form and commit the laboratory to fulfill the NVLAP requirements. Only the Authorized Representative can authorize a change in the scope or nature of the laboratory's application. This person is listed in NVLAP directories and will receive all correspondence and inquiries from NVLAP.

The Authorized Representative may also be an Approved Signatory.

Approved Signatory

The laboratory must designate one or more staff members as Approved Signatories. The name of at least one Approved Signatory must appear on all test reports endorsed with the NVLAP logo (see section Use of the NVLAP Logo elsewhere in this Handbook). This person is responsible for the technical contents of the report and is the one to be contacted by NVLAP, laboratory clients, or others in case of questions or problems with the report.

There is no formal requirements for nominations or approval of persons designated as Approved Signatories. Approved Signatories must be persons with appropriate responsibility, authority and technical capability within the organization. The laboratory must maintain a list of Approved Signatories and make that list available for review during on-site assessments.

Laboratory test reports carrying the NVLAP logo need not be signed individually by the Approved Signatory. Test report forms may be preprinted with the required information. Forms that are electronically or computer generated may have the information printed along with the test results.

Renewal

Each participating laboratory will be sent a renewal Application Package, well in advance of the expiration date of its accreditation, to allow sufficient time to complete the renewal process. The technical requirements and fees for renewal are generally the same as for initial accreditation.

The application and fees must be received by NIST prior to expiration of the laboratory's current accreditation to avoid a lapse in accreditation. If an on-site assessment is required, the application and fees must be received to allow sufficient time for the visit to be completed and deficiencies corrected prior to expiration of accreditation. In addition, any current proficiency testing requirements must be met.

Keeping NVLAP Informed

During the accreditation period, a laboratory must inform NVLAP:

of any major changes involving the location, ownership, management structure, authorized representative, technical director, approved signatories, or facilities;

if it wishes to delete a test method; or

if it is no longer capable of performing test methods or services for which it is accredited.

If a laboratory elects not to renew or wishes to voluntarily terminate its accreditation at any time, the notification of such intention should be forwarded to NVLAP in writing.

Additions to Scope of Accreditation

During the accreditation period, a laboratory may request the addition of test methods or services to its Scope of Accreditation. The laboratory must meet all NVLAP criteria for the additional test methods or services such as fees, proficiency testing, technical requirements, etc. The need for an additional on-site assessment will be determined on a case-by-case basis.

NVLAP Directory

NVLAP publishes an annual Directory of Accredited Laboratories. The Directory contains the name and address, scope of accreditation, contact person, and the accreditation renewal date for each accredited laboratory. Supplements to the Directory are published quarterly to cover interim accreditation actions including initial accreditations, renewals, suspensions, terminations, and revocations. The Directory is distributed nationally and internationally to manufacturers, suppliers, retailers, professional and trade associations, code groups, and government agencies.

Referencing Your Accredited Status and Use of the NVLAP Logo

Accredited laboratories are encouraged, within specified limits, to announce their accredited status. The NVLAP logo may be used in such announcements. Photographic copies of the logo are available from the NVLAP office.

A laboratory must limit the representation of the scope of its accreditation to only those tests or services for which accreditation has been granted. The following statement is recommended: "Accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program for selected test methods or service."

In Advertising

Laboratory advertising of accredited status must be limited to professional, technical, trade, or other laboratory services publications. Letterhead referencing NVLAP accreditation may be used in direct solicitation for business from potential customers. It is recommended that a copy of the NVLAP Certificate and Scope of Accreditation be appended to such a solicitation.

News stories and advertising by laboratories of their accredited status in the trade press is permissible and encouraged. The use of advertisements in the trade press is consistent with NVLAP procedures.

Laboratories may not reference their accredited status in consumer media, in product advertising, or on product labels, containers and packaging. The nature or type of product advertising prohibited by NVLAP procedures includes any advertising that is intended to encourage a consumer to purchase a product because it was tested by an accredited laboratory, whether that advertising appears in consumer media, the business media, or at a point of sale to consumers. Advertising must not imply product certification by NVLAP, NIST, or the U.S. Government.

On Laboratory Documents

As long as a laboratory is NVLAP accredited, it may use the NVLAP logo on letterhead and brochures, preferably with the qualifying quote given above. The logo may be used on test reports that are within the scope of accreditation. These reports must bear the name of an Approved Signatory in accordance with the guidelines given in the Approved Signatory section of this Handbook. Policy Guides 11 and 12 (see Appendix B) describe additional test report requirements.

Compliance With Existing Laws

Accreditation does not relieve the laboratory of the need to observe and comply with existing Federal, State, and local statutes, ordinances, or regulations that may be applicable to its operations, including consumer protection and antitrust laws.

IV. TECHNICAL EXPERTS

NVLAP uses Technical Experts (TEs) as assessors and evaluators. They may be engineers or scientists currently active in the field, consultants, college professors or retired persons. They are selected on the basis of their professional and academic achievements, experience in the field of testing, management experience, and tact in dealing with people. Their services are generally contracted as required; they are not NVLAP staff members.

Assessors are TEs selected to conduct an on-site assessment of a particular laboratory on the basis of how well their individual experience matches the type of testing to be assessed, as well as absence of conflicts of interest. The laboratory has the right to appeal the assignment of an assessor and may request an alternate.

Evaluators are TEs selected to review the record of the laboratory as a whole, including the application, assessment report, deficiencies, corrections to deficiencies, and proficiency test results and, based on this record, to recommend whether or not a laboratory should be accredited. The evaluators are matched to the type of testing being evaluated and are selected to avoid conflicts of interest.

V. ACCREDITATION PROCESS

Accreditation is granted following successful completion of a process which includes submission of an application and payment of fees by the laboratory, an on-site assessment, resolution of deficiencies identified during the on-site assessment, participation in proficiency testing, technical evaluation, and administrative review. The process is described in the following sections.

Application and Fees

An **Application Package** is sent to a laboratory on request. It includes: **General Application Forms**, **Fee Calculation forms**, and the program Handbook. The **General Application Form** must be completed and signed by the authorized representative of the laboratory. Before completing and signing the application, the authorized representative should review all documents and become familiar with NVLAP requirements.

In general, the accreditation fee is composed of several parts, some of which are fixed while others depend on the scope of accreditation desired and the specifics of the program. The total accreditation fee must be paid before accreditation can be granted. The individual parts of the accreditation fee include, as appropriate: an Administrative and Technical Support fee, a Test Method fee, a Proficiency Testing fee, the cost of reference materials and quality assurance samples, and an On-Site Assessment fee. The fees for this accreditation program are shown in the Fee Calculation Sheet included in the Application Package.

The laboratory will be contacted to schedule a mutually acceptable date for the on-site assessment after payment of all required fees and will be notified of any additional information which must be supplied, and of any applicable proficiency testing requirements which must be completed, for the technical evaluation.

On-site Assessment

Before initial accreditation and periodically thereafter, an on-site assessment of each laboratory is conducted to determine compliance with the NVLAP criteria. The assessment is conducted by one or more NVLAP assessors selected on the basis of their expertise in the field of testing to be reviewed. Assessors use checklists developed by NVLAP so that each laboratory receives an assessment comparable to that received by others. However, assessors have some latitude to make judgments about a laboratory's compliance with the NVLAP criteria.

Each laboratory will be contacted to arrange a mutually agreeable date for an assessment. An assessment normally takes one to three days depending on the extent of the laboratory's application. Every effort is made to conduct an assessment with as little disruption as possible to the normal operations of the laboratory. During the assessment the assessor will:

- meet with management and supervisory personnel responsible for the laboratory's activities (for which accreditation is being sought) to review the assessment process with the individuals involved and to set the assessment agenda.
- examine the quality assurance system employed by the laboratory. The assessor may select and trace the history of one or more samples from receipt to final issuance of test reports. The assessor will conduct a thorough review of the laboratory's quality manual or equivalent, evaluate the training program, examine notebooks or records pertaining to the samples, check sample identification and tracking procedures, determine whether the appropriate environmental conditions are maintained, and examine copies of completed test reports.
- review records of periodic internal audits, use of check-samples or participation in round robin testing or other similar programs.

- review personnel records including resumes and job descriptions of key personnel, competency evaluations for all staff members who routinely perform the testing for which accreditation is sought, calibration or verification records for apparatus used, test reports, and sample control records.
- observe demonstrations of testing techniques and discuss them with the technical personnel to assure their understanding of the procedures.
- examine major equipment, apparatus, and facilities for appropriateness, capability, adherence to specifications, etc.

At the conclusion of the assessment, the assessor will conduct an exit briefing to discuss observations with responsible laboratory staff. A written assessment report will be left with the laboratory. The assessor will forward the assessment forms and a copy of the report to NVLAP.

Monitoring Visits

In addition to regularly scheduled assessments, monitoring visits may be conducted by assessors or by NIST staff at any time during the accreditation period. The scope of a monitoring visit may range from checking a few designated items to a complete review. Monitoring visits may occur for cause or on a random selection basis. These visits serve to verify reported changes in the laboratory's personnel, facilities, and operations or to explore possible reasons for poor performance in proficiency testing.

Proficiency Testing

Proficiency testing is an integral part of the NVLAP accreditation process. Demonstration of appropriate facilities, equipment, personnel, etc., is essential, but may not be sufficient for a complete evaluation of laboratory competence. The actual performance of tests and reporting of results using special proficiency testing samples provides NVLAP with a way to determine the overall effectiveness of the laboratory (see Appendix B).

Proficiency testing is a process for checking actual laboratory testing performance, usually by means of inter-laboratory comparisons. Each accreditation program has unique proficiency testing requirements. The data are analyzed by NVLAP and summary reports of the results are sent to the participants.

Information obtained from proficiency testing helps to identify problems in a laboratory. When problems are found, NVLAP staff members work with the laboratory staff to solve them. If problems with the test method are suspected, NVLAP provides information to the appropriate standards writing bodies.

The specific proficiency testing requirements for this Program are included elsewhere in this document.

Deficiency Notification and Resolution

A deficiency is the failure of a laboratory to meet a NVLAP criterion. Deficiencies may be determined during on-site assessments, monitoring visits, proficiency testing, NVLAP staff review, and Technical Evaluation. Laboratories are informed of deficiencies during the on-site assessment and through other correspondence.

When a laboratory is notified by NVLAP of deficiencies, the laboratory must respond in writing to NVLAP within 30 days of the notification. The response must provide documentation, signed by the authorized representative, that the specified deficiencies have either been corrected or that specific actions are being taken to make corrections. A timetable for completion of corrections should be included.

A laboratory which is currently accredited must correct all deficiencies noted within 30 days of notification or face possible revocation, suspension, or expiration without renewal of its accreditation.

Test equipment that is identified as deficient should not be used until corrective action has been completed. Evidence of correction must be sent to NVLAP.

If substantial deficiencies have been cited, NVLAP may conduct an additional on-site assessment prior to granting accreditation. All deficiencies and resolutions will be subject to thorough review and corrective actions verified during subsequent assessments and technical evaluations.

Technical Evaluation

When a laboratory is ready for an accreditation action, a final technical evaluation is conducted by experts chosen for their experience and knowledge of the pertinent test methods. They review records on each applicant laboratory and base their evaluation on:

- information provided on the application;
- on-site assessment reports;
- actions taken by the laboratory to correct deficiencies;
- results of proficiency testing; and
- information from any monitoring visits of the laboratory.

If the technical evaluation reveals additional deficiencies, written notification describing them will be made to the laboratory. The laboratory must respond within 30 days of such notification and provide documentation, signed by the authorized representative, that the specified deficiencies have been corrected. Clarification of some issues may be requested by telephone. All deficiencies must be corrected before accreditation can be granted or renewed.

Administrative Review

After the technical evaluation has been completed, the NVLAP staff prepares an administrative recommendation that the laboratory either be granted or denied accreditation. This recommendation is based on a review of the technical evaluation and other records to ensure that all NVLAP technical, financial and administrative requirements have been satisfied.

Accreditation Actions

The following accreditation actions may be taken by NIST:

Accreditation If accreditation is recommended, the recommendation forms the basis for granting accreditation. A **Certificate of Accreditation** and a **Scope of Accreditation** will be issued to the laboratory.

Denial If denial is recommended, the laboratory is notified of a proposal to deny accreditation and the reason(s) therefor.

Suspension If a laboratory is found to have violated the terms of its accreditation, the accreditation can be suspended. The laboratory will be notified of the reasons for and conditions of the suspension and the action(s) that the laboratory must take to have accreditation reinstated.

Revocation If a laboratory is found to have violated the terms of its accreditation, the laboratory is notified of a proposal to revoke accreditation and the reasons therefor. The laboratory may be given the option of voluntarily terminating accreditation. If accreditation is revoked, the laboratory must return its **Certificate of Accreditation** and cease use of the NVLAP logo on any of its reports, correspondence, or advertising.

If denial or revocation has been proposed, the laboratory may request, in writing, a hearing, under United States Code 5 U.S.C. 556, within 30 days of the date of receipt of the notification. If a hearing is not requested, the action becomes final upon the expiration of that 30-day period.

When accreditation has been terminated, whether voluntarily or through adverse action, the accreditation certificate must be returned to NVLAP.

VI. TECHNICAL REQUIREMENTS

Section 7.33 of the NVLAP Procedures, found in Appendix A, contains the Criteria for accreditation expressed in general terms. The following interpretive comments and additional requirements make the criteria specifically applicable to laboratories which perform acoustical testing services. The requirements listed in Section 7.33 and those specified in this section must be met in order to gain accreditation.

SCOPE OF THE PROGRAM

NVLAP grants accreditation to laboratories to perform specific test methods when possible. Each laboratory selects the test method(s) for which it desires accreditation. Appendix E contains a cumulative list of test methods for which accreditation is currently granted. A laboratory may request accreditation for any test method, listed or not, which is found to be technically appropriate both in terms of relationship to the program and accreditation.

QUALITY SYSTEM (See Appendix A, Sec. 7.33a)

To qualify for accreditation a laboratory must have a documented system of procedures and practices which assure the quality of its services. During the on-site assessment, an applicant must demonstrate that the quality systems used ensure the technical integrity of the work.

Quality systems documents must be up-to-date and thoroughly describe all procedures and practices. They should describe such items as methods of implementation, responsible personnel, record-keeping systems, operating procedures, procedures to employ in the event of unusual or non-standard circumstances, and scheduling. Written descriptions shall include at least the following topics:

- Organizational chart;
- Laboratory facility and scope of services offered;
- Duties of key personnel;
- Personnel training procedures;
- Personnel competency assurance;
- Test equipment inventory;
- Test equipment calibration, verification, and maintenance practices;
- Specimen handling, control, and identification;
- Actions concerning damaged specimens;
- Data handling and reporting; and
- Actions when variations in test data indicate a problem exists; and
- Procedures regarding subcontract testing - see appendix B Policy Guide No. 11.

The documentation must be so arranged to be readily accessible to all staff members. It may be in the form of a single manual or may be distributed, in sections, to various locations throughout the laboratory. If separate sections are used, a central reference document must be available to indicate where the individual sections may be found. The documentation must be in a format and style which can be easily understood by technicians.

The assessor will review the procedures and documentation which support each area for which accreditation is requested.

STAFF (see Appendix A, Sec. 7.33b)

Technical Staff

The laboratory shall maintain a staff which is technically capable of conducting the required testing functions and has a sufficient number of persons to adequately handle the quantity of testing required.

Technical Director

The laboratory technical director shall be a professional experienced in acoustics testing who is knowledgeable in the design and operation of the system(s) currently utilized. This individual must have the technical competence and the supervisory capability to direct the work of professionals and technicians.

Quality Assurance

The laboratory must name a staff member who has overall responsibility for the quality assurance program. This may be the technical director or another individual having knowledge and experience in quality assurance and who has a direct line of communication to the technical director and other organizational management.

Training

Each new staff member must be trained for assigned duties and existing staff members must be retrained when equipment and/or procedures are changed or they are assigned new responsibilities. Each staff member must receive training for assigned duties either through on-the-job training, formal classroom sessions or through certification programs recognized by NVLAP.

Competency

In addition to training, the competency of each staff member must be evaluated by observing the performance of each procedure each staff member is authorized to conduct. The performance observation must be conducted at least annually by the immediate supervisor or his designee. A record of the staff member's performance must be placed in the personnel file, dated and signed by the supervisor.

The assessor will review resumes or other information to substantiate the qualifications of the technical director and all key individuals.

Any organizational or personnel changes that could affect the performance of the services offered (e.g., change of Technical Director, technical supervision, responsibility for quality assurance program, or substantial change in staff) shall be reported to NVLAP within 30 calendar days of such change.

FACILITIES AND EQUIPMENT (See Appendix A, Sec. 7.33c)

All facilities and equipment used for performing the applicable tests must conform with the requirements of the standard test methods. If, by modification, the equipment is different from that called for by the test method, the laboratory must provide evidence (e.g., comparative test results, round robins, analytical or mathematical proof) that use of the modified equipment results in test data which are equivalent to what would be obtained by the test equipment specified in the test method.

Laboratory test rooms must be characterized for sound absorption coefficient for the frequency range(s) of interest. Temperature and humidity must be monitored and controlled in all rooms when conducting tests. All rooms must have adequate volume to make measurements with the sound source employed. Documented data must be presented to substantiate the characterization of each room. Accreditation documents will specify the frequency range for which a test room is qualified. The microphones and all associated test equipment must be calibrated and/or verified; and the laboratories calibration procedures must include written evidence of a thorough understanding of the necessary calibrations.

The laboratory workspace and any environmentally controlled spaces will be checked for proper conditions, including monitoring devices.

CALIBRATION (See Appendix A, Sec. 7.33d and Appendix F)

A record of the apparatus or instrumentation used to perform acoustical testing must include the information specified in appendix A, Sec. 7.33c.3. All test equipment inherently subject to change due to use or time, must be periodically calibrated. Calibration means comparison with a reference standard so that the performance of a measuring instrument may be determined with sufficient accuracy. Calibrations (verifications) may be performed by the laboratory or by an external calibration service.

All calibrations and characterizations must be done against reference standards that are traceable to national standards maintained by NIST or by an equivalent foreign national standards authority. Traceability means that it can be shown that appropriate documented actions were taken to compare (either directly or indirectly) a reference standard with the national standard.

The reference standards used and the environmental conditions at the time of calibration must be documented for all calibrations. Calibration records and evidence of the traceability of the reference standards used must be made available for inspection during the on-site visit.

All equipment used in performing accredited test methods must be calibrated (verified) according to the following order of priority:

- (1) as specified in the test method,
- (2) in accordance with the manufacturer's recommendation or,
- (3) once a year.

A list of apparatus requiring verification is contained in Appendix F.

In addition to the items in Sec. 7.33d.3 of Appendix A, equipment calibration (verification) records should include:

- identity of the laboratory individual or external service responsible for calibration;
- source of reference standard and traceability; and,
- calibration data.

If calibration is performed by the laboratory, metrology standards used and assurance of the maintenance of any required environmental conditions must be documented.

TEST METHODS AND PROCEDURES (See Appendix A, Sec. 7.33e)

A laboratory must have written procedures for the technicians to follow when conducting a test. These may be custom written by the laboratory (using the proper method as the reference) or may be a copy of the actual test method. The laboratory must have in-house the latest published versions (within one year of publication) of all the test methods for which accreditation has been requested, and any applicable referenced standards, practices, or procedures.

RECORDS (See Appendix A, Sec. 7.33f)

Records covering the following items are required and will be reviewed during the on-site visit either in total or by selective sampling:

- staff training dates and results;
- staff competency review dates and results;
- equipment calibration and maintenance;
- test data and reports; and
- specimen control

Specimen control records must trace the movement of specimens from sampling/receipt to completion of testing. Dates, times, condition of sample and names of personnel involved should be included.

TEST REPORTS (See Appendix A, Sec. 7.33g)

All test reports issued with a NVLAP Logo applied must meet the test report requirements. In addition to Sec. 7.33g, the report must contain any unique requirements specified in a test method. Records of all test reports issued must be maintained for at least three years.

A laboratory is accredited to perform tests in "strict conformance" with the standard test method as written. If a laboratory knowingly deviates from a method during the performance of a test the deviation must be described on the final test report. If any test or portion of a test is performed by a subcontractor, see appendix B for requirements.

VII PROFICIENCY TESTING

Laboratories are required to participate in proficiency testing. This may require the analysis of material reference samples. Participation in these proficiency testing programs will vary from year to year, depending on the laboratory's scope of accreditation. Instructions for participating in proficiency testing will be provided as required. Laboratories must submit results of proficiency testing to NVLAP when completed.

Applicant laboratories may be required to participate satisfactorily in proficiency testing prior to initial accreditation. Laboratories renewing accreditation must have participated satisfactorily in all required proficiency testing during the previous accreditation period. (See appendix B Policy Guide #13).

APPENDICES

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APPENDIX A

CODE OF FEDERAL REGULATIONS

TITLE 15 - COMMERCE AND FOREIGN TRADE

SUBTITLE A - OFFICE OF THE SECRETARY OF COMMERCE

CHAPTER II - NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

PART 7 - NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM PROCEDURES

SUBPART D - CONDITIONS AND CRITERIA FOR ACCREDITATION

(15 CFR Part 7)

NVLAP PROCEDURES - TITLE 15, PART 7, CODE OF FEDERAL REGULATIONS

SUBPART D - CONDITIONS AND CRITERIA FOR ACCREDITATION

Sec. 7.31 Application of accreditation conditions and criteria

(a) To become accredited and maintain accreditation, a laboratory must meet the conditions for accreditation set out in Section 7.32 and the criteria set out in Section 7.33 as tailored for specific LAPs.

(b) The conditions leading to accreditation include acceptance of the responsibilities of an accredited laboratory and requirements for information disclosure.

(c) The criteria are tailored and interpreted for the test methods, types of test methods, products, services or standards of the relevant LAP. These tailored criteria are the technical requirements for accreditation developed through the procedures of Section 7.15.

(d) In applying the conditions, criteria, and technical requirements for accreditation, NVLAP shall not:

- (1) Prohibit accreditation solely on the basis of a laboratory's affiliation or nonaffiliation with manufacturing, distributing, or vending organizations, or because the laboratory is a foreign firm; or
- (2) Develop, modify, or promulgate test methods, standards, or comparable administrative rules.

Sec. 7.32 Conditions for accreditation

(a) To become accredited and maintain accreditation, a laboratory shall agree in writing to:

- (1) Be assessed and evaluated initially and on a periodic basis;
- (2) Demonstrate, on request, that it is able to perform the tests representative of those for which it is seeking accreditation;
- (3) Pay all relevant fees;
- (4) Participate in proficiency testing as required.
- (5) Be capable of performing the tests for which it is accredited according to the latest version of the test method within one year after its publication or within another time limit specified by NVLAP;
- (6) Limit the representation of the scope of its accreditation to only those tests or services for which accreditation is granted;
- (7) Limit all its test work or services for clients to those areas where competence and capacity are available;
- (8) Limit advertising of its accredited status to letterheads, brochures, test reports, and professional, technical, trade, or other laboratory services publications, and use the NVLAP logo under guidance provided by NVLAP;
- (9) Inform its clients that the laboratory's accreditation or any of its test reports in no way constitutes or implies product certification, approval, or endorsement by NIST;
- (10) Maintain records of all actions taken in response to testing complaints for a minimum of one year;

- (11) Maintain an independent decisional relationship between itself and its clients, affiliates, or other organizations so that the laboratory's capacity to render test reports objectively and without bias is not adversely affected;
 - (12) Report to NVLAP within 30 days any major changes involving the location, ownership, management structure, authorized representative, approved signatories, or facilities of the laboratory; and
 - (13) Return to NVLAP the certificate of accreditation for possible revision or other action should it:
 - (i) Be requested to do so by NVLAP;
 - (ii) Voluntarily terminate its accredited status; or
 - (iii) Become unable to conform to any of these conditions the applicable criteria of Section 7.33 and related technical requirements.
- (b) To become accredited and maintain accreditation, a laboratory shall supply, upon request, the following information:
- (1) Legal name and full address;
 - (2) Ownership of the laboratory;
 - (3) Organization chart defining relationships that are relevant to performing testing covered in the accreditation request;
 - (4) General description of the laboratory, including its facilities and scope of operation;
 - (5) Name and telephone number of the authorized representative of the laboratory;
 - (6) Names or titles and qualifications of laboratory staff nominated to serve as approved signatories of test reports that reference NVLAP accreditation; and
 - (7) Other information as may be needed for the specific LAP(s) in which accreditation is sought.

Sec. 7.33 Criteria for accreditation

(a) Quality System

- (1) The laboratory shall operate under an internal quality assurance program appropriate to the type, range, and volume of work performed. The quality assurance program must be designed to ensure the required degree of accuracy and precision of the laboratory's work and should include key elements of document control, sample control, data validation, and corrective action. The quality assurance program must be documented in a quality manual or equivalent (e.g., operations notebook) which is available for use by laboratory staff. A person(s) must be identified as having responsibility for maintaining the quality manual.
- (2) The quality manual must include as appropriate:
 - (i) The laboratory's quality assurance policies including procedures for corrective action for detected test discrepancies;
 - (ii) Quality assurance responsibilities for each function of the laboratory;
 - (iii) Specific quality assurance practices and procedures for each test, type of test, or other specifically delineated function performed;

- (iv) Specific procedures for retesting, control charts, reference materials, and inter-laboratory tests; and
 - (v) Procedures for dealing with testing complaints.
- (3) The laboratory shall periodically review its quality assurance system by or on behalf of management to ensure it's continued effectiveness. These reviews must be recorded with details of any corrective action taken.

(b) Staff

- (1) The laboratory shall:
- (i) Be staffed by individuals having the necessary education, training, technical knowledge, and experience for their assigned functions; and
 - (ii) Have a job description for each professional, scientific, supervisory and technical position, including the necessary education, training, technical knowledge, and experience.
- (2) The laboratory shall document the test procedures each staff member has been assigned to perform.
- (3) The laboratory shall have a description of its training program for ensuring that new or untrained staff are able to perform tests properly and uniformly to the requisite degree of precision and accuracy.
- (4) The laboratory shall be organized:
- (i) So that staff members are not subjected to undue pressure or inducement that might influence their judgment or results of their work; and
 - (ii) In such a way that staff members are aware of both the extent and the limitation of their area of responsibility.
- (5) The laboratory shall have a technical manager (or similar title) who has overall responsibility for the technical operations of the laboratory.
- (6) The laboratory shall have one or more signatories approved by NVLAP to sign test reports that reference NVLAP accreditation. Approved signatories shall:
- (i) Be competent to make a critical evaluation of test results; and
 - (ii) Occupy positions within the laboratory's organization which makes them responsible for the adequacy of test results.

(c) Facilities and Equipment

- (1) The laboratory shall be furnished with all items of equipment and facilities for the correct performance of the tests and measurements for which accreditation is granted and shall have adequate space, lighting, and environmental control, and monitoring to ensure compliance with prescribed testing conditions.
- (2) All equipment must be properly maintained to ensure protection from corrosion and other causes of deterioration. Instructions for a proper maintenance procedure for those items of equipment which require periodic maintenance must be available. Any item of equipment or component thereof which has been subjected to overloading or mishandling, gives suspect results, or has been shown by calibration or otherwise to be defective, must be taken out of service and clearly labelled until it has been repaired. When placed back in service, this equipment must be shown by test or calibration to be performing its function satisfactorily.

- (3) Records of each major item of equipment must be maintained. Each record must include:
- (i) The name of the item of equipment;
 - (ii) The manufacturer's name and type, identification and serial number;
 - (iii) Date received and date placed in service;
 - (iv) Current location, where appropriate;
 - (v) Details of maintenance; and
 - (vi) Date of last calibration, next calibration due date, and calibration report references.

(d) Calibration

The laboratory shall:

- (1) Calibrate new testing equipment before putting it into service;
- (2) Recalibrate, at regular intervals, in-service testing equipment with the calibration status readily available to the operator;
- (3) Perform checks of in-service testing equipment between the regular calibration intervals, where relevant;
- (4) Maintain adequate records of all calibrations and recalibrations; and
- (5) Provide traceability of all calibrations and reference standards of measurement where these standards exist. Where traceability of measurements to primary (national or international) standards is not applicable, the laboratory shall provide satisfactory evidence of the accuracy or reliability of test results (e.g., by participation in a suitable program of interlaboratory comparison).

(e) Test Methods and Procedures

The laboratory shall:

- (1) Conform in all respects with the test methods and procedures required by the specifications against which the test item is to be tested, except that whenever a departure becomes necessary for technical reasons the departure must be acceptable to the client and recorded in the test report;
- (2) Have data to prove that any departures from standard methods and/or procedures due to apparatus design or for other reasons do not detract from the expected or required precision of the measurement;
- (3) Maintain a test plan for implementing testing standards and procedures including adequate instructions on the use and operation of all relevant equipment, on the handling and preparation of test items (where applicable), and on standard testing techniques where the absence of such instructions could compromise the test. All instructions, testing standards, specifications, manuals, and reference data relevant to the work of the laboratory must be kept up-to-date and made readily available to the staff;
- (4) Maintain measures for the detection and resolution of in-process testing discrepancies for manual and automatic test equipment and electronic data processing equipment, where applicable;
- (5) Maintain a system for identifying samples or items to be tested, which remains in force from the date of receipt of the item to the date of its disposal, either through documents or through marking to ensure that there is no confusion regarding the identity of the samples or test items and the results of the measurements made; and

- (6) Maintain rules for the receipt, retention, and disposal of test items, including procedures for storage and handling precautions to prevent damage to test items which could invalidate the test results. Any relevant instructions provided with the tested item must be observed.

(f) Records

The laboratory shall:

- (1) Maintain a record system which contains sufficient information to permit verification of any issued report;
- (2) Retain all original observations, calculations and derived data, for one year unless a longer period is specified; and
- (3) Hold records secure and in confidence, as required.

(g) Test Reports

- (1) The laboratory shall issue test reports of its work which accurately, clearly, and unambiguously present the specified test results and all required information. Each test report must include the following information as applicable:
 - (i) Name and address of the laboratory;
 - (ii) Identification of the test report by serial number, date, or other appropriate means;
 - (iii) Name and address of client;
 - (iv) Description and identification of the test specimen, sample, or lot of material represented;
 - (v) Identification of the test specification, method, or procedure used;
 - (vi) Description of sampling procedure, if appropriate;
 - (vii) Any deviations, additions to, or exclusions from the test specifications;
 - (viii) Measurements, examinations, and derived results supported by tables, graphs, sketches, and photographs, as appropriate, and any failures identified;
 - (ix) A statement of measurement uncertainty, where relevant;
 - (x) Identification of the organization and the person accepting technical responsibility for the test report and date of issue;
 - (xi) A statement that the report must not be reproduced except in full with the approval of the laboratory; and
 - (xii) A statement to the effect that the test report relates only to the items tested.
- (2) The laboratory shall issue corrections or additions to a test report only by a further document suitably marked, e.g. "Supplement to test report serial number," which meets the relevant requirements of Section 7.33(g)(1).
- (3) The laboratory shall retain a copy of each test report issued for one year unless a longer period is specified by NVLAP.
- (4) The laboratory shall ensure that all test reports endorsed with the NVLAP logo are signed by an approved signatory.

APPENDIX B
NVLAP POLICY GUIDES



POLICY GUIDE

Number 10
June 1988
(Reprinted June 1989)

This Policy Guide presents NVLAP definitions of the types of laboratory facilities which may be granted NVLAP accreditation, the requirements and conditions that must be satisfied in order to achieve accreditation, and procedures that NVLAP will follow in evaluating various types of facilities for their conformance to accreditation criteria.

Definitions:

a. Main (laboratory) facility:

- (1) permanently (at all times) maintains staff, equipment, procedures, documentation, and facilities necessary to perform the tests, for which it seeks accreditation;
- (2) implements all quality assurance procedures;
- (3) maintains and retains all records, and issues test reports; and
- (4) may be a permanently fixed site or a permanent mobile facility.

b. Sub-facility is physically separate from, but considered an extension of, its main facility. Although it may have all staff, equipment, procedures, and documentation necessary to perform the requisite tests, it receives technical direction and quality assurance management from the main facility.

1. A permanent sub-facility maintains staff, equipment, procedures, documentation, and facilities necessary to perform the tests, for which it seeks accreditation, at all times. It may be a permanently fixed site or a permanent mobile facility and is expected to remain in operation for at least one year.
2. A temporary sub-facility is provided with staff, equipment, procedures, documentation, and facilities necessary to perform the tests, for which it seeks accreditation, on an interim basis, to meet the needs of the main facility. A temporary sub-facility may be established at a fixed site or in a mobile facility and is expected to remain in operation less than one year.

Conditions for Accreditation:

NVLAP accreditation of a laboratory main facility does not extend to accreditation of sub-facilities unless the sub-facilities have been separately evaluated. These facilities are uniquely identified in the NVLAP accreditation

documents. A NVLAP-accredited laboratory must not present or report test data, produced at any non-accredited, sub-facility as having been produced under the status of NVLAP accreditation.

NVLAP offers accreditation to laboratories that are found competent to perform specific test methods or types of tests in specified fields of testing. Competence is defined as the ability to meet specific technical criteria relating to quality assurance, staff, equipment, facilities, procedures, records, and reports. Technical criteria may or may not be equally applicable to main facilities and sub-facilities. Accreditation of sub-facilities may require NVLAP criteria that address the use and maintenance of equipment and facilities, and the implementation of procedures, that are particularly applicable to the performance of specific test methods in sub-facilities. NVLAP must develop specific technical criteria upon which to base an objective evaluation of staff, facilities, equipment, and procedures employed in applicable sub-facilities.

NVLAP will accredit a main facility if the facility complies with all applicable NVLAP criteria.

NVLAP will accredit a sub-facility (in addition to the main facility) if:

- a. the laboratory main facility meets all NVLAP accreditation criteria;
- b. the laboratory main facility satisfactorily documents and maintains quality assurance procedures addressing the applicable sub-facility; and,
- c. the sub-facility complies with all applicable NVLAP criteria.

Procedures:

In principle, NVLAP will require that sub-facilities, to be included in a laboratory's accreditation, undergo on-site assessments and participate in proficiency testing. NVLAP staff, with the guidance of NVLAP technical experts, will determine the need for and extent of such evaluations based on the number and location of similar sub-facilities managed by the laboratory, the nature of the quality assurance system, and any special technical considerations. Decisions on the need for and extent of the evaluations may not be made until after the accreditation of the main facility. The conditions and requirements for evaluation of sub-facilities providing specific testing services are described in NVLAP documents pertaining to the relevant accreditation program.

Laboratories seeking NVLAP accreditation should clearly state, on the NVLAP Application Form, what type(s) of sub-facilities are to be included in the accreditation. NVLAP fees for on-site assessments and proficiency testing will be based on the number of facilities seeking accreditation that are required to undergo on-sites and participate in proficiency testing. A single administrative/technical support fee is charged to the laboratory (main facility).



POLICY GUIDE

Number 11
March 1989

USE OF SUBCONTRACTORS BY ACCREDITED LABORATORIES

When a laboratory accredited by NVLAP issues a test report containing the NVLAP logo or other indication of NVLAP accreditation, it is implied that the report reflects work performed, and results obtained, by the personnel, equipment, and procedures of that laboratory. However, in some cases a laboratory may require the use of another facility (subcontractor) e.g., due to equipment failure, need for specialized equipment, work overload, or to perform tests outside the laboratory's scope, etc., in order to meet contractual obligations.

The following policy applies whenever the NVLAP logo or other reference to a laboratory's accredited status is used on a test report.

NVLAP POLICY. Whenever a laboratory accredited by NVLAP subcontracts to another laboratory the performance of any test or portion of a test it must clearly identify in its records, and in the report to the client, specifically which test method(s) or portion of a test method(s) were performed by the accredited laboratory and which were performed by the subcontractor. The laboratory must also inform the client, before the fact, that subcontracting will be necessary.

Definition of SUBCONTRACTOR: Any facility not covered under a laboratory's NVLAP accreditation, as defined in the accreditation documents, utilized by the laboratory to produce test data, e.g., laboratories not affiliated with the NVLAP laboratory, facilities within the same corporate structure that are not included in the accreditation, such as franchises, or subsidiaries.

REQUIREMENTS NVLAP policy regarding an accredited laboratory subcontracting any test or portion of a test which will reference the laboratory's accredited status requires the following of an accredited laboratory.

1. The laboratory's policy regarding the use of subcontractors must be included in the Quality Assurance Manual.
2. The laboratory must notify the client that some testing will be subcontracted (identity of subcontractor not required in advance).

NVLAP Policy Guide 11 - continued

3. Any test report issued that contains data produced by a subcontractor and displays the NVLAP logo or other indication of NVLAP accreditation, must include:

Subcontractor ACCREDITED by NVLAP

- a statement at the beginning of the report prominently indicating
" This report contains data which was produced by a subcontracted laboratory accredited by NVLAP for the test methods performed";
- clear indication of which data was produced by the subcontractor;
- name, address, and contact person of the subcontracted facility(ies);
- the NVLAP lab code of the subcontractor(s);
- a description of the test(s) performed, and results obtained.

Subcontractor NOT ACCREDITED by NVLAP

- a statement at the beginning of the report prominently indicating
" This report contains data which was produced by a subcontracted laboratory which is not accredited by NVLAP ";
- clear indication of which data was produced by the subcontractor;
- name, address, and contact person of the subcontracted facility(ies);
- a description of the test(s) performed; and results obtained;



POLICY GUIDE

Number 12
April 1989

TEST REPORTS ISSUED BY ACCREDITED LABORATORIES

When a laboratory accredited by NVLAP issues a test report containing the NVLAP logo or other indication of NVLAP accreditation, it is implied that the report reflects work performed, and results obtained, under the conditions of the accreditation. Frequently however, laboratories perform other testing which is not covered by the NVLAP accreditation.

NVLAP POLICY. Whenever a laboratory accredited by NVLAP issues a test report which contains data from the performance of any test or portion of a test not covered by the accreditation it must clearly identify in its records, and in the report to the client, specifically which test method(s) or portion of a test method(s) were not covered by the accreditation. The laboratory must also inform the client, before the fact, when tests requested are not covered by the accreditation.

REQUIREMENTS. NVLAP policy regarding test reports issued by an accredited laboratory which references the laboratory's accredited status, requires the following.

- 1) Any test report that contains data from tests which are not covered by the accreditation must include:
 - a statement at the beginning of the report prominently indicating " This report contains data which is not covered by the NVLAP accreditation";
 - clear indication of which data is not covered by the accreditation
- 2) A description of the laboratory's policy regarding the use of the NVLAP logo must be included in the Quality Assurance Manual.
- 3) The laboratory must not misrepresent its accreditation. When a client requires or requests accredited services and any of the requested services are not covered by the accreditation, the client must be so advised.



POLICY GUIDE

Number 13
July 1989
(Replaces Policy
Bulletin No. 19)

SATISFACTORY PROFICIENCY TESTING IS A REQUIREMENT FOR ACCREDITATION

Accreditation by the National Institute of Standards and Technology, under the National Voluntary Laboratory Accreditation Program (NVLAP), requires that a laboratory meet all performance requirements and criteria as determined by on-site assessments and proficiency testing.

If, as the result of on-site assessments, deficiencies are found, the laboratory must satisfactorily resolve those deficiencies, in order to obtain initial accreditation or maintain accreditation.

Unsatisfactory participation in any NVLAP proficiency testing program is a technical deficiency which must be resolved in order to obtain initial accreditation or maintain accreditation.

Unsatisfactory participation in NVLAP proficiency testing programs is defined as, but not limited to, one or more of the following:

1. Failure to meet specified proficiency testing performance requirements prescribed by a standard or test method for which the laboratory is seeking accreditation. (Example: ANSI Standard N13.11 for the Dosimetry Program.)
2. Failure to participate in a regularly scheduled "round" of proficiency testing for which the laboratory has received instructions and/or materials.
3. Failure to submit laboratory control data as required.
4. Performance as a statistically outlying laboratory in two successive rounds of proficiency testing or showing a general pattern of outlying test results over three or more rounds.
5. Failure to produce test data within acceptable limits of error when testing NIST Standard Reference Materials or special artifacts whose properties are well characterized and known to NIST/NVLAP.

NVLAP will notify the laboratory of proficiency testing deficiency(s) and actions to be taken to resolve the deficiency(s). Denial or suspension of accreditation will result from failure to resolve deficiencies.



POLICY GUIDE

Number 14
July 1989
(Replaces Policy
Bulletin No. 4)

ACCREDITATION OF FOREIGN LABORATORIES

Foreign laboratories, located outside of the continental United States, may be accredited by NVLAP on the same basis as U.S. domestic laboratories. Foreign laboratories must meet the same requirements and criteria as domestic laboratories. The criteria are defined in the NVLAP Procedures and technical Handbooks provided to all applicants. Accreditation is granted based on compliance with all NVLAP criteria as determined by on-site assessments and the results of proficiency testing programs.

Since NVLAP is a cost-reimbursable program, the fees charged foreign laboratories must cover all costs in excess of those associated with the accreditation of domestic laboratories. Additional fees will be charged to foreign laboratories for travel by assess outside of the United States and for shipment of proficiency testing materials to the laboratories.

Upon application, a foreign laboratory must forward payment of NVLAP fees (as calculated on the Fee Calculation Sheet) in U.S. currency. The laboratory will be notified of additional travel and proficiency testing costs which must be paid to NVLAP before an assessor leaves to perform the on-site assessment.

In cases where laboratory documents are not in English, or laboratory personnel do not speak English, it is the responsibility of the laboratory to provide a translator to assist the NVLAP assessor during the inspection. The translator will assist the assessor to converse directly with laboratory management and technical staff and to review laboratory documentation. Documents such as quality control manuals, protocols, standards, and test reports need not be translated into English solely for NVLAP purposes.

An export license, issued by the U.S. Department of Commerce, may be required for certain equipment to be sold outside the United States. If a foreign laboratory applying for NVLAP accreditation must own the required equipment, the laboratory must have a valid export license. For export license information call (202) 377-4811 or write to: U.S. Department of Commerce, Export Administration, Exporter Assistance, P.O. Box 273, Washington, DC 20230.

APPENDIX C

NVLAP LAB BULLETINS

There are currently no NVLAP LAB BULLETINS that apply to this program.

APPENDIX D

SAMPLE SCOPE AND CERTIFICATE OF ACCREDITATION

United States Department of Commerce
National Institute of Standards and Technology

NVLAP

Certificate of Accreditation

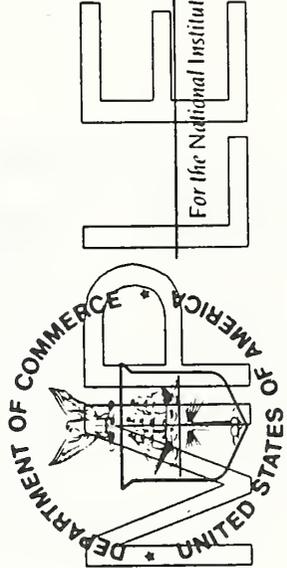
LABORATORY, INC.
ANYTOWN, USA

*is recognized under the National Voluntary Laboratory Accreditation Program
for satisfactory compliance with criteria established in Title 15, Part 7 Code of Federal Regulations.
Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:*

ACOUSTICAL TESTING SERVICES

January 1, 19--

Effective until



For the National Institute of Standards and Technology

SCOPE OF ACCREDITATION

ACOUSTICAL TESTING SERVICES

Page 1 of 1

NVLAP LAB CODE 0294

LABORATORY, INC.
1 Main Street, Anytown, USA 00000
John Doe Phone: 301-555-1212

Accreditation Renewal Date: January 1, 19--

<u>NVLAP Code</u>	<u>Designation</u>	<u>Short Title</u>
08/P03	ANSI/ASTM C423	Sound Absorption and Sound Absorption Coefficients
08/P06	ANSI/ASTM E90	Airborne Sound Transmission Loss of Building Partitions
08/P10	ANSI S1.31	Sound Power Levels, Broad-Band Noise Sources in Reverberation Rooms (100-10,000 Hz)
08/P13	ANSI S1.32	Sound Power Levels, Discrete-Frequency and Narrow-Band Noise Sources in Reverberation Rooms



APPENDIX E
TEST METHOD LIST

ACOUSTICAL TESTING SERVICES

(ACOUSTICS LAP)

Test Method List

Accreditation may also be requested for other test methods not included in the Test Method Selection List. Please attach a list of any additional test methods for which accreditation would be desired. If the methods are suitable for accreditation, NVLAP will evaluate your laboratory for those methods during the on-site assessment.

* See explanation of notes at end of Test Method listing.

Test Method

DesignationShort Title

PRECISION MEASUREMENTS

ANSI/ASTM C367-78	Strength Properties, Prefabricated Architectural Acoustical Materials
ANSI/ASTM C384-88	Impedance and Absorption of Acoustical Materials
ANSI/ASTM C423-89	Sound Absorption and Sound Absorption Coefficients
ASTM C522-87	Airflow Resistance of Acoustical Materials
ASTM C523-68 (87)	Light Reflectance of Acoustical Materials
* ANSI/ASTM E90-87	Airborne Sound Transmission Loss of Building
Partitions	
ANSI/ASTM E492-86	Impact Sound Transmission Through Floor-Ceiling Assemblies
ANSI/ASTM E596-88	Noise Reduction of Sound-Isolating Enclosures
* ASTM E756-83	Vibration Damping Properties of Materials
* ANSI S1.31-80 ¹	a. Sound Power Levels, Broad-Band Noise Sources in Reverberation Rooms
	b. (direct method only)
	c. (comparison method only)
* ANSI S1.32-80 ²	Sound Power Levels, Discrete Frequency and Narrow-Band Noise Sources in Reverberation Rooms
* ANSI S1.35-79 ¹	a. Sound Power Levels, Noise Sources in Anechoic and Hemi-Anechoic Rooms
	b. (anechoic room method only)
	c. (hemi-anechoic room method only)
* ISO 3741-88 ¹	a. Sound Power Levels, Broad-Band Sources in Reverberation Rooms
	b. (direct method only)
	c. (comparison method only)
* ISO 3742-88 ³	Sound Power Levels, Discrete Frequency and Narrow-Band Sources in Reverberation Rooms
* ISO 3745-88 ¹	a. Sound Power Levels, of Noise Sources in Anechoic and Semi-Anechoic Rooms
	b. (anechoic room method only)
	c. (semi-anechoic room method only)

ENGINEERING MEASUREMENTS

ANSI B71.1-80 (para. 9)	Sound Level Tests; Power Lawn Mowers, Lawn and Garden Tractors and Lawn Tractors
ANSI S1.29-79 ⁴	Measurement of Noise Emitted by Computer and Business Equipment
* ANSI S1.34-80	Sound Power Levels, Noise Sources over a Reflecting Plane
* ANSI S3.19-74	Noise Protection, Hearing Protectors and Earmuffs
ANSI S5.1-84	a. Measurement of Sound from Pneumatic Equipment
	b. (small machines only)
	c. (portable compressors and large items of pneumatic plants only)
	d. (stationary plant equipment only)
ANSI S12.10-85	Noise Emitted by Computer and Business Equipment
ISO 362-81	Noise Emitted by Accelerating Road Vehicles
ISO 512-79	Sound Pressure Levels, Vehicle Signaling Devices
ISO 3744-81	Sound Power Levels of Noise Sources Over a Reflecting Plane
ISO 5130-82	Noise Emitted by Stationary Road Vehicles
ISO 7779-88	Airborne Noise by Computer and Business equipment
SAE J192a-85	Exterior Sound Level of Snowmobiles
SAE J1161-83	Sound Level Measurement Procedure for Snow Vehicles
Title 40, CFR, Part 205	a. Transportation Equipment Noise Emission Measurements
	b. (Subpart B only)
	c. (Subpart D only)
	d. (Subpart E only)
	e. (Subpart F only)
AMCA Test Code	Test Code for Sound Ratings
300-1967	
AMA-1-II-67 ⁵	Ceiling Sound Transmission Test by Two-Room Method
EEC 81/334 (Annex I, para. 5.2) ⁶	Sound Levels of Motor Vehicles
EEC 70/388 (Annex I, paras. 1.2.1, 1.2.2, 1.2.3, and 2) ⁶	Type Approval of an Audible Warning Device
TRIAS 20-1980 ⁷	Noise Test Procedures for Motor Vehicles
TRIAS 21-1979 ⁷	Horn Sound Level Test Procedure for Motor Vehicles
ECE Regulation No. 28 ⁸	Sound Levels of Vehicle Audible Warning Devices

Notes:

1. The laboratory will be accredited for only the frequency range for which its test room is qualified.
 2. Accreditation for this test method also requires accreditation for ANSI S1.31. Also, accreditation for ANSI S1.32 will be only for the frequency range for which the laboratory's test room is qualified.
 3. Accreditation for this test method also requires accreditation for ISO 3741. Also, accreditation for ISO 3742 will be only for the frequency range for which the laboratory's test room is qualified.
 4. Accreditation for this test method also requires accreditation for one or more of the following methods. ISO 3741, ISO 3742, ISO 3744, and ISO 3745.
 5. Adopted by the Ceiling and Interior Systems Contractors Association
 6. Council of European Communities
 7. Ministry of Transport - Japan Automobile Importation Association
 8. United Nations regulation
- * Periodic proficiency testing may be required

APPENDIX F
CALIBRATION REQUIREMENTS

APPENDIX F

Calibration Requirements

<u>Apparatus/Instrumentation</u>	<u>Calibration/or Verification Frequency</u>
Acoustic calibration or pistonphones	annually
Balances	annually
Engines-speed tachometers	annually
Filter sets (octave-band and one-third octave-band)	annually
Flowmeters (air)	annually
Frequency analyzers	annually
Frequency counters	annually
Force gauges	annually
Oscillators	annually
Reference microphones	annually
Reference sound sources (calibration in accordance with ANSI S1.35 or ISO 3745)	annually
Tape recorders or graphics level recorders	annually
Test signal (pink noise) generators	annually
Test signal (pure tone) generators	annually
Timers	annually
Wave-form generators	annually
Hygrometers	semi-annually
Temperature	semi-annually
Pressure measuring devices (air)	semi-annually
Voltmeters (precision)	semi-annually
Environmental Chambers	semi-annually for ASTM Test Method E756 only
Loudspeakers for ANSI S1.32 or ISO 3742	During each test room qualification
Pick-up transducer systems (generator, amplifier, recorder, etc.) once a year for ASTM Test Method E756 only.	spot-check prior to each test, full calibration
Reflectometers	check calibration before each test
Sound measurement systems	calibrate before and after each test series using an acoustical calibrator or piston phone
Sound pressure level meters	same as above

APPENDIX G
ASSESSMENT CHECKLIST

GENERAL OPERATIONS CHECKLIST

Instructions to the Assessor: This checklist addresses general accreditation criteria prescribed in Section 7.33, Subpart D, of the NVLAP Procedures and other requirements specified in the Program Handbook.

Check to determine if the laboratory, in your opinion, satisfies each item listed. Indicate with an "X" any item which you feel is deficient. Indicate with a "C" any item which you wish to make a comment. Record the item number and your written deficiency explanation and/or comment on the comment form(s). Place a check beside all other items you observed or verified at the laboratory.

Some items require comments to be made. Some items are to be used in conjunction with the TEST METHOD SUMMARY FORM.

Quality System.

The laboratory QA program:

- _____ 1-1. is appropriate to the type, range, and volume of work performed;
- _____ 1-2. allows for independent decisions so that objective unbiased reports can be issued;
- _____ 1-3. has a method to periodically review the QA system to ensure continued effectiveness and documentation of the review and any actions taken;
- _____ 1-4. is documented in a quality manual or equivalent, which is available to laboratory staff;
- _____ 1-5. has a person responsible for maintaining the quality manual (INDICATE IN COMMENTS);

The quality manual describes as appropriate:

- _____ 1-6. QA responsibilities for each staff position in the laboratory;
- _____ 1-7. specific QA practices and procedures for each test or type of test, such as control charts, use of reference materials, and inter-laboratory tests, (EXPLAIN IN COMMENTS);
- _____ 1-8. procedures for document control, sample control, data validation, corrective action for detected test discrepancies;
- _____ 1-9. procedures for dealing with testing complaints from clients;
- _____ 1-10. the staff training program and policies (DESCRIBE IN COMMENTS);
- _____ 1-11. how staff competence is maintained (DESCRIBE IN COMMENTS);
- _____ 1-12. sample handling, identification, custody, contamination control;
- _____ 1-13. general equipment maintenance and calibration procedures;
- _____ 1-14. copies of most recent edition of all test methods;
- _____ 1-15. procedures for conducting NVLAP proficiency testing;
- _____ 1-16. procedures to follow in unusual circumstances, e.g. damaged specimens, special specimens;
- _____ 1-17. policy and procedure regarding subcontracting;

GENERAL OPERATIONS CHECKLIST - continued

Staff

- _____ 2-1. staff members are not subjected to undue pressure or inducement that might influence their judgement or the results of their work.
- _____ 2-2. staff members are aware of both the extent and limitation of their area of responsibility.

The laboratory has:

- _____ 2-3. job descriptions for each position, including any required education, training, technical knowledge, and experience;
- _____ 2-4. documents for each staff member, showing the training completed, competency evaluation results, and test methods assigned to perform;
- _____ 2-5. a technical manager (or similar title) with appropriate technical background who has overall responsibility for the technical operations of the laboratory;

Facilities and Equipment - USE IN CONJUNCTION WITH THE TEST METHOD SUMMARY FORM

- _____ 3-1. The laboratory has all necessary items of equipment and facilities for the correct performance of the tests and measurements for which accreditation is being sought.
- _____ 3-2. Equipment which has been overloaded or mishandled, gives suspect results, or is defective, is taken out of service until repaired.
- _____ 3-3. When placed back in service, repaired equipment is shown to be performing satisfactorily.
- _____ 3-4. Records of each major item of equipment are maintained including:
 - a. name of the item of equipment;
 - b. manufacturer's name;
 - c. type, identification, and serial number;
 - d. date received and date placed in service;
 - e. current location, where appropriate;
 - f. details of maintenance;
 - g. date of last calibration, next calibration due date, and calibration report references.

Calibration - USE IN CONJUNCTION WITH THE TEST METHOD SUMMARY FORM

The laboratory:

- _____ 4-1. calibrates new or repaired testing equipment before putting it into service;
- _____ 4-2. calibrates, at regular intervals, in-service testing equipment with the calibration status readily available to the operator;
- _____ 4-3. performs checks of in-service testing equipment between the regular calibration intervals, where relevant;
- _____ 4-4. maintains adequate records of all calibrations;
- _____ 4-5. provides traceability of any calibrations or reference standards of measurement where these standards exist or other satisfactory evidence of the accuracy or reliability of test results.

GENERAL OPERATIONS CHECKLIST - continued

Test Methods and Procedures - USE IN CONJUNCTION WITH THE TEST METHOD SUMMARY FORM

The laboratory:

- _____ 5-1. performs the test methods and procedures for which accreditation is being sought;
- _____ 5-2. explains departures from standard test methods to clients and records departures in the test report;
- _____ 5-3. has data to prove that departures from standard methods do not detract from the expected or required precision of the measurement;
- _____ 5-4. keeps instructions, testing standards, specifications, manuals, and reference data up-to-date and readily available to the staff;
- _____ 5-5. uses the system described in the QA manual for identifying samples or items to be tested;
- _____ 5-6. uses the procedures described in the QA manual for receipt, retention, and disposal of specimens.

Records

The laboratory:

- _____ 6-1. maintains a record system with sufficient information to permit report verification;
- _____ 6-2. retains original observations, calculations and derived data, and calibration records for one year unless a longer period is specified;
- _____ 6-3. holds records secure and confidential.

Test Reports

- _____ 7-1. The laboratory issues accurate, clear test reports.

Test reports include, as applicable:

- _____ 7-2. name and address of the laboratory or other appropriate, unique identification;
- _____ 7-3. identification of the test report by serial number, date, or other appropriate means;
- _____ 7-4. name and address of client or other appropriate unique identification;
- _____ 7-5. description and identification of the test specimen, sample, or lot of material represented;
- _____ 7-6. identification of the test specification, method, or procedure used;
- _____ 7-7. description of sampling procedure, if appropriate;
- _____ 7-8. deviations, additions to, or exclusions from the test specifications;
- _____ 7-9. measurements, examinations, and derived results supported by tables, graphs, sketches, and photographs, as appropriate, and any failures identified;
- _____ 7-10. a statement of measurement uncertainty, where relevant;
- _____ 7-11. a statement that the report must not be used by the client to claim product endorsement by NVLAP or any agency of the U. S. Government;

GENERAL OPERATIONS CHECKLIST - continued

- _____ 7-12. a statement to the effect that the test report relates only to the items tested;
- _____ 7-13. All test reports endorsed with the NVLAP logo contain the signature of an approved signatory;
- _____ 7-14. Test reports identify subcontractors.

BIBLIOGRAPHIC DATA SHEET

TITLE AND SUBTITLE

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Acoustical Testing Services

AUTHOR(S)

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ABSTRACT (A 200-WORD OR LESS FACTUAL SUMMARY OF MOST SIGNIFICANT INFORMATION. IF DOCUMENT INCLUDES A SIGNIFICANT BIBLIOGRAPHY OR LITERATURE SURVEY, MENTION IT HERE.)

This document explains the operational and technical requirements of the National Voluntary Laboratory Accreditation Program for Acoustical Testing Services. All of the steps leading to the accreditation are discussed. Technical requirements are explained indicating how the NVLAP criteria are applied.

This Handbook is intended for use by the staff of accredited laboratories, those seeking accreditation, other laboratory accreditation systems, and others needing information on the requirements for NVLAP accreditation under this program.

KEY WORDS (6 TO 12 ENTRIES; ALPHABETICAL ORDER; CAPITALIZE ONLY PROPER NAMES; AND SEPARATE KEY WORDS BY SEMICOLONS)

accreditation; assessment; Acoustics; laboratory; NVLAP; proficiency testing

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